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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/816,184

04/02/2004

Jens Stacker

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04/25/2006

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EXAMINER

UNDERWOOD, JARREAS C

ART UNIT

PAPER NUMBER

2877

DATE MAILED: 04/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/816,184

Applicant(s)

STACKER, JENS

Examiner

Jarreas C. Underwood

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on _____ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/18/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because of undue length. Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities: The claim for priority is stated, however the year listed on page one of the specifications (2004) is not the year in which the German application was filed (2003). Appropriate correction is required.

Claim Objections

3. Claim 5 recites the limitation "calculated with the aid of the two profiles" on page 26, lines 3-4. There is insufficient antecedent basis for this limitation in the claim as claim 1 defines only one line profile. Examiner suggests claim 5 be dependent on claim 2. Appropriate correction is required.
4. Claims 12, 15 are objected to because of the following informalities: The phrase "in one of claim 9" is inconsistent. Examiner suggests the removal of the words "one of". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-13, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al (U.S. Patent 6,724,464) in view of Kato et al (U.S. Patent 5,7226,757).

5. As to claim 9, Yang discloses an apparatus having an optical alignment system for determining the position of an alignment mark, which is arranged on the surface of the semiconductor wafer and has regular structures, the optical alignment system comprising the following devices:

a first optical measuring device for determining a first position information item of the alignment mark in a predetermined direction with the aid of an optical measurement method that is optimized for position determination (Figure 1, element AS and column 7, line 63 – column 8, line 10),

a positioning device for setting the relative position of the semiconductor wafer with respect to the first and/or second optical measuring device (Figure 1, element 24 and column 7, lines 45-52).

While Yang discloses multiple detection devices, it is not specified that a device determine a line profile for the alignment mark. However to do so is well

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known as taught by Kato. Kato discloses an observation optical system (Figure 8, element 74, column 10, lines 17-39) that includes an auto-focus function (column 14, line 52 – column 15, line 6). The output signals of the CCD are line images (compare Kato Figures 15-17, 19-21 to application Figure 6).

It would have been obvious to one having ordinary skill in the art at the time of invention to include a CCD auto-focusing device, in order to detect the best focus positions of a first substrate such as a mask and a second substrate such as a plate (column 3, lines 41-55).

6. As to claim 10, Yang in view of Kato discloses everything claimed, as applied above, including that the device of Yang is a microscope (column 7, lines 63-64).

7. As to claim 11, Yang in view of Kato discloses everything claimed, as applied above, including that the second optical measuring device detects diffraction patterns which are caused by the interaction of light radiation light radiation from a light source with the regular structures of the alignment mark (Kato: column 1, lines 50-66).

It would have been obvious to one having ordinary skill in the art at the time of invention to include a CCD device capable of detecting diffraction patterns, in order to measure a positional deviation between the first and second substrates (e.g. a mask and a wafer).

8. As to claim 12, Yang in view of Kato discloses everything claimed, as applied above, including a data processing device in order to determine a second position information item of the alignment mark from the first position information

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item and the line profile (Yang: Figure 1, element 20 and column 7, lines 18-29).

It is assumed that since the first detector (Figure 1, element AS) is connected to the Main Control System (Figure 1, element 20), the second detector from Kato would also be so connected.

9. As to claim 13, Yang in view of Kato discloses everything claimed, as applied above, including a data processing device which determines the line profile of the alignment mark (Kato: Figures 15-17) from the diffraction patterns (column 1, lines 50-66).

10. As to claim 15, Yang in view of Kato discloses everything claimed, as applied above, including the optical alignment system being arranged within a lithography installation (Yang: Figure 1).

11. As to claims 1, 3, 5-8 the apparatus of claim 9 is capable of performing all the method steps as claimed.

12. As to claim 2, the apparatus of claim 10 is capable of performing all the method steps as claimed.

13. Claims 4, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Kato as applied to claims 1-3, 5-13, 15 above, and further in view of Lin (U.S. Patent Application Publication 2001/0033996).

14. As to claim 14, Yang in view of Kato discloses everything claimed, as applied above with the exception of a comparison device in order to adjust the diffraction patterns determined with diffraction patterns of a database.

15. Lin teaches a comparison device (Figure 1, element 26) which adjusts the diffraction patterns determined with diffraction patterns of a database (Figure 1,

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element 30 and paragraphs 0048-0049). It would have been obvious to one having ordinary skill in the art at the time of invention to include a comparison device and database, in order to determine the Critical Dimension variations and distortion on the CCD image, and to correct the CD and distortion on the mask.

16. As to claim 4, the apparatus of claim 14 is capable of performing all the method steps as claimed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

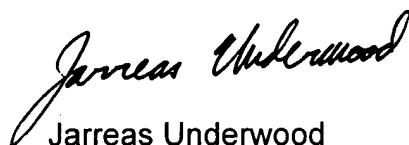
Hirayanagi (U.S. Patent 6,180,289); Nishi (U.S. Patent 6,563,565).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jarreas C. Underwood whose telephone number is (575) 272-1536. The examiner can normally be reached on Monday-Friday 0700-1530.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on (571) 272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jarreas Underwood
Patent Examiner
Art Unit 2877
4/19/2006



LAYLA G. LAUCHMAN
PRIMARY EXAMINER

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